The Easterlin Hypothesis

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"The Easterlin, or 'cohort size', hypothesis posits that, other things constant, the economic and social fortunes of a cohort (those born in a given year) tend to vary inversely with its relative size, approximated by the crude birth rate in the period surrounding the cohort's birth" (Easterlin, 1987, p. 1)

Abstract: Easterlin formulates one of the most popular fertility theories. He supports that fertility follows some regular cycles, with large birth cohorts producing small cohorts, and vice versa. There are two complementary aspects in this theory: the effect of the relative number of the young adults (relative cohort size), and the effect of the wages and unemployment (relative income); the second one being a subjacent mechanism to the first one. Thus, individuals from a large cohort face up to the deterioration of their standard of living relative to their parents. They will make then adjustments to preserve the comparative positions and therefore their material aspirations, particularly adjustments in family life such as the decline in fertility. Thus, the induced fertility by the large cohort effects makes this one reverse the next cohort size.

Just after the World War I, there was a renewed interest for the demographic problems because of their political aspects with the development of a favourable movement to "Birth Control" and also with the adoption of a legislation encouraging the birth rate (such as the French law in 1920). Then, some 20th

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century authors, in particular Richard Easterlin, innovated and developed models to explain how fertility responds to economic factors. Firstly, he proposed a dynamic prospect by admitting the possibility of changing preferences and secondly completed the *New Home Economics*' model (neo-classic economic model pioneered by Becker[2]) which is strictly turned to the demand side. Furthermore, the Easterlin model provides an important theoretical contribution to the economic fertility approach, by constituting one of the singular generational theories completely achieved (Diebolt and Doliger, 2005).

Richard Easterlin (1985) shows that fertility depends on two sets of variables: the *"voluntary" regulation variables* of fertility, which are determined by the couples in a deliberated way to control their fertility, and the *other close determinants* (sexual intercourse frequency, fecondability, duration of breast feeding...), which depend on biological characteristics and cultural practices. According to Easterlin, it's essential to determine the factors which affect the "voluntary" regulation variables. So it's necessary to understand what the desired number of children is (i.e. the demand for children C_d), how much children a couple can have (i.e. the supply of children C_n), and how much the planning family economically and psychologically costs when demand is lower than supply (i.e. regulation cost RC).

On the supply side (C_n), the major analytical concept is the potential production of children, that is to say the number of surviving children that a household should have if it voluntarily doesn't restrict fertility. This one depends on survival probability from birth until adulthood and natural fertility which is partially linked to psychological or biological factors but also cultural practices (social standards). As the economic theory suggests, the determinants of children demand (i.e. of C_d) are income, prices and preferences. In order to maximize households' satisfaction subject to prices and income, their children demand results from the trade-off between goods and children preferences. In fact the economists' empirical and theoretical works were traditionally on prices and income rather than on preferences since the household production function formulates the influence of preferences partially in term of household technology. Then, Easterlin (1969) argues that the preferences formation should have a greater importance in research in regards to fertility, and that such a work should strength the link between Economics and Sociology. Finally, both potential production of children (C_n) and demand for children (C_d) determine the motivation to regulate fertility. If the potential production is lower than the demand $C_n < C_d$ (excess demand), there's no desire to limit fertility, the parents expect to have as many children as they can, i.e. parents should have their potential production of children. On the other side, if the potential production is higher than the demand $C_n > C_d$ (excess supply), the parents will face up to the

[2] In this framework, the children demand can be treated in the same way that the durable goods demand, and the fertility fluctuations can be explained by using only prices and incomes arguments.

possibility of having unwanted children and will be motivated to control their birth rate. In that case, the implementation of a planning family will depend on the comparison between the motivation to limit fertility and the costs of this regulation (RC).

From this formalization, Easterlin formulates one of the most popular fertility theories. He supports that fertility follows some regular cycles, with large birth cohorts producing small cohorts, and vice versa. According to him, the proportion of young adults during any 20 years period is a reflection of the 20 past year's birth rates. In fact, a small-sized cohort allows a better job-market insertion (labour market with high wages and a fast-paced career), a better standard of living, and thus a greater fertility. Then 20 years later, it results a large-sized cohort, a more difficult insertion and a less fertility. Thus, there are two complementary aspects in this theory (the second one being a subjacent mechanism to the first one):

- the effect of the relative number of the young adults (relative cohort size),
- the effect of the wages and unemployment (relative income).

The first aspect of this theory is that the number of young adults depends on the births in their generation. According to Easterlin (1980), the economic and social prosperity of one young adult cohort evolves in an opposite direction to the relative size of this cohort because of "crowding mechanisms" which operate inside the three more important social institutions: Family, School and Labour Market. The *family crowding effect* means that a sustained high growth of birth rate is likely to increase the average number of children, the average birth order, and decrease the average birth interval. And as psychology, sociology, and more recently economy show, all these factors are recognized to have negative effects on the children development (Behrman et al., 1980; Ernest and Angst, 1983; Heer, 1985; Wray, 1971). But, even in the absence of unfavourable family effects, a large cohort will face up to an *education crowding effect* which will have negative consequences on school success (Freeman, 1976; Waring, 1975). Since the stock of physical and human capital of school system is in fixed quantity or developed with constant rate, a large number of students entering the school system will be accompanied by a reduction of the physical capacities and the number of teachers by student, which will reduce the school success rate. Thus, school crowding coming from a large cohort decreases quantity and quality of received education. In the same way, a large proportion of young workers who enter the *labour market* create a new *crowding* phenomenon. This mechanism can be explained by supply and demand arguments: a higher supply of young workers yields tougher competition for a limited number of jobs requiring young workers, whereas when supply is short the young workers can easily choose their job and accept only those which offer high wages and a fast-paced career.

Easterlin uses the second aspect of his theory - namely *relative income* hypothesis - to link these crowding mechanisms to the fertility behaviour of the young adults. He supports that the marriage and fertility determinants are the expected earnings of young adults, their material aspiration and their socialization (religion, education and environment). The labour market situation is used to measure the young adults' expected incomes whereas their material aspiration is supposed to be formed during adolescence in the parental household: children raised in well-off families will probably have relatively high levels of consumption. Therefore, the young adults' material aspiration should reflect the previous situation of the parental household in the labour market. Thus, the comparison between their expected incomes and their desired standard of living - the *relative income* - is measured by the ratio of the couple's current income (earning expectation) to the previous parents' income (material aspiration). Consequently, Easterlin advances that *this* ratio makes couples decide to have more or fewer children. In fact, a more favourable situation (i.e. an rise in the relative income) indicates less economic pressure on the couple. Thus, households will be freer to marry and to have children.

To sum up, in the "relative cohort size" or "relative income" model, individuals from a large cohort face up to the deterioration of their standard of living relative to their parents. They will make adjustments to preserve the comparative positions and therefore their material aspirations, particularly adjustments in family life (Espenshade, 1985; Moffitt, 1982) such as the rise in female labour force participation and the decline in fertility. Nevertheless, the induced fertility by the large cohort effects makes this one reverse the next cohort size. Therefore, this model completes the usual assumption that the reduction in fertility rates results from changes in the female labour force participation, by empathizing that all behavioural changes are, at least partly, a response to the relative income.

By taking as a starting point the work of P. Samuelson (1976) and H. Le Bras (1980), and under simplified assumptions, it's possible to model the Easterlin hypothesis. Let a population include three age-specific groups with two possible parent's generations, those born with the preceding generation and those born two generations before. Thus, the population is composed of children (B_t), young adults (B_{t-1}), and old adults (B_{t-2}). Also, we suppose, as the Easterlin's theory underlines it, that the children are generated by the young adults at fluctuating rate $f(t)$ and by the old adults at fixed rate b. This differentiation is necessary because the majority of the decisions concerning marriage and maternity are supposed to be concentrated in the young adult's category in which the fertility decisions could be influenced by the fundamental determinants.

According to Easterlin, the young adults fertility rate $f(t)$ depends on the relative cohort size, that is to say the ratio of the old adults (B_{t-2}) to the young

adults (B_{t-1}). Consequently, for the young adults whose parents were born with the preceding generation, the young adults fertility rate *f(t)* is equal to

$$f(t) = f\left[\frac{B_{t-2}}{B_{t-1}}\right] \quad (1)$$

And for those whose parents were born two generations before, the fertility rate is

$$f(t) = f\left[\frac{B_{t-3}}{B_{t-1}}\right] \quad (2)$$

where *f(t)* is supposed to reproduce the framework proposed by Easterlin. In other words, when the young adults (B_{t-1}) are relatively numerous, their fertility drops and when they are relatively scarce then it's high:

$$\frac{\partial f}{\partial B_{t-1}} < 0 \quad , \quad \frac{\partial f}{\partial B_{t-2}} > 0 \quad , \quad \frac{\partial f}{\partial B_{t-3}} > 0$$

Then, the reproduction model with two parents' generations has the following form[3]:

$$B_t = \Phi(t)B_{t-1} + bB_{t-2} \quad (3)$$

Consequently, for the young adults cohort in *t* being born in *t-1*, this size is:

$$B_{t-1} = \Phi(t-1)B_{t-2} + bB_{t-3} \quad (4)$$

[3] For simplified, it's supposed that there is absence of mortality.

Thus, the number of births starting from the young adults cohort in t (B_{t-1}) is:

$$\Phi(t)B_{t-1} = \underbrace{\Phi(t-1)B_{t-2}f\left[\frac{B_{t-2}}{B_{t-1}}\right]}_{\substack{\text{number of young adults whose parents were born with preceding generation multiplied by their fertility rate}}} + \underbrace{bB_{t-3}f\left[\frac{B_{t-3}}{B_{t-1}}\right]}_{\substack{\text{number of young adults whose parents were born two generations before multiplied by their fertility rate}}}$$

(5)

According to the first aspect of Easterlin's theory (relative cohort size), if we only consider two parents categories (those born with the previous period and those born two periods before), the fluctuating fertility rate at period t which represents the young adults' fertility rate is written:

$$\Phi(t) = \frac{\Phi(t-1)B_{t-2}f\left[\frac{B_{t-2}}{B_{t-1}}\right] + bB_{t-3}f\left[\frac{B_{t-3}}{B_{t-1}}\right]}{B_{t-1}}$$

(6)

By generalizing the model with n parents generations where only the class of the youngest adults - B_{t-1} - has a fluctuating fertility rate, the reproduction equation becomes:

$$B_t = \Phi(t)B_{t-1} + \sum_{i=2}^{n} b_i B_{t-i}$$

(7)

where

$$\Phi(t) = \frac{\Phi(t-1)B_{t-2}f\left[\frac{B_{t-2}}{B_{t-1}}\right] + \sum_{i=2}^{n} b_i B_{t-1-i}f\left[\frac{B_{t-1-i}}{B_{t-1}}\right]}{B_{t-1}}$$

(8)

And still according to the Easterlin's hypothesis, when the size of the first age group increases, the rate decreases, and conversely, when the size of a former age group increases, the rate increases, thus:

$$\frac{\partial \Phi}{\partial B_{t-1}} < 0 \quad et \quad \frac{\partial \Phi}{\partial B_{t-i}} > 0 \qquad \forall i > 1$$

Thus, in the Easterlin hypothesis, the formation of the material aspiration (estimated by the parental income) is the basis of decision-making process to have or not to have children. However, some questions can be raised about the Easterlin's analytical framework, and especially about the foundations of his theory, namely the formation of material aspirations. Does home environment constitute the main factor or even the only one influencing the young adults' aspirations? Usual consumption during adolescence undoubtedly influences preferences, but it seems reasonable to think that the young couple's standard of living and its interaction with other individuals (neighbours, friends, co-workers...) should also influence preferences. In particular, Leibenstein (1976) insists on the need - for an aspirations analysis - to include the desire to reach a standard of living relative to another group, and the desire to maintain the consumption differential relative to the other socio-economic groups. So, he advances that the preservation of one's consumption obligations and the enjoyment of the same number of children as the previous generation are getting more and more difficult because a visible consumption scale is subject to the limitation of the relative income.

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